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(11) EP 0 874 428 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:  
04.11.1998 Bulletin 1998/45

(51) Int. Cl.<sup>6</sup>: H01S 3/19, H01S 3/085

(43) Date of publication A2:  
28.10.1998 Bulletin 1998/44

(21) Application number: 98106843.0

(22) Date of filing: 15.04.1998

(84) Designated Contracting States:  
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE  
Designated Extension States:  
AL LT LV MK RO SI

(30) Priority: 23.04.1997 US 839112

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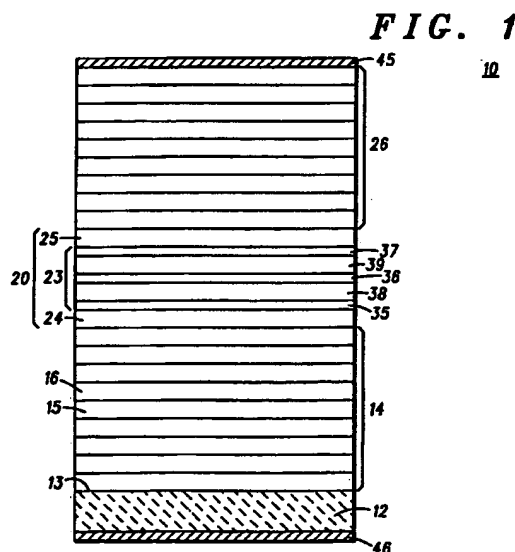
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(54) Long wavelength VCSEL

(57) A VCSEL for emitting long wavelength light including a GaAs (111) substrate element (12), a first mirror stack (14) with mirror pairs in a GaAs/AlGaAs material system lattice matched to a GaInAsN active region (20) with an active structure (23) sandwiched between a first cladding region (24) adjacent the first mirror stack (14) and a second cladding region (25), the active structure (23) including a nitride based quantum well (35, 36, & 37), and a second mirror stack (26) lattice matched to the second cladding region (25) and having mirror pairs in a GaAs/AlGaAs material system.



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## EUROPEAN SEARCH REPORT

Application Number  
EP 98 10 6843

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	T MIYAMOTO, T. TAKADA, ET AL: "Design and expected characteristics of 1.3 µm GaInNAs/GaAs vertical cavity surface emitting lasers" QUANTUM OPTOELECTRONICS 1997, TECHNICAL DIGEST SERIES, POSTCONFERENCE EDITION, , vol. 9, 19 - 21 March 1997, page 126-128 XP002075850 Incline Village NV USA * the whole document *	1-9	H01S3/19 H01S3/085
Y	US 5 383 211 A (VAN DE WALLE CHRIS ET AL) 17 January 1995 * column 5, line 19-39 *	1-9	
A	KONDOW M ET AL: "A NOVEL MATERIAL OF GAINAS FOR LONG-WAVELENGTH-RANGE LASER DIODES WITH EXCELLENT HIGH-TEMPERATURE PERFORMANCE" INTERNATIONAL CONFERENCE ON SOLID STATE DEVICES AND MATERIALS, 21 August 1995, pages 1016-1018, XP000544869 * the whole document *	1-9	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H01S
A	EP 0 723 303 A (HEWLETT PACKARD CO) 24 July 1996 * the whole document *	1-9	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28 August 1998	Examiner Claessen, L
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P4/C01)